CONFINED SPACE

29 CFR 1910.146



OBJECTIVES

- Define a Confined Space
- Define a Permit-Required Confined Space
- Be Familiar with the OSHA Standard and the basic elements of the standard
- Understand the Hazards Associated with Confined Spaces and How to Detect Them
- Understand How to Control Confined Hazards
- Understand Personal Protective Equipment

Confined Space: Definition

- A Confined Space means a space that:
- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has a limited or restricted means for entry or exit (For example: tanks, vessels, silos, pits, vaults, hoppers); and,
- Is not designed for continuous employee occupancy.

Permit Required Confined Space: * A Permit Required Confined Space means

A Permit Required Confined Space means a confined space that has one or more of the following characteristics:

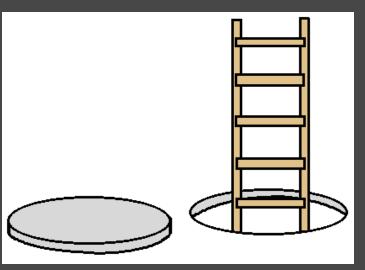
Contains or has a potential to contain a hazardous atmosphere,

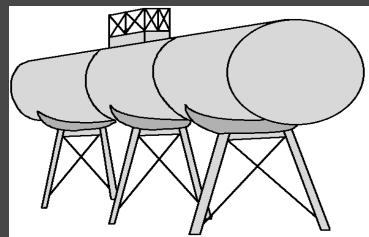
Contains a material that has the potential for engulfing an entrant,

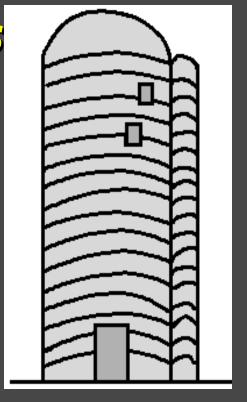
Permit Required Confined Space: Definition (cont'd)

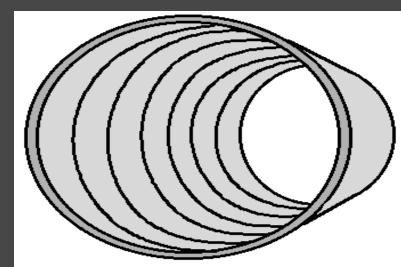
- Definition (cont'd)
 A Permit Required Confined Space means a confined space that has one or more of the following characteristics:
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other serious safety or health hazard.

Confined Spaces Examples











- ★ (1) Internal configuration.
 - (a) Open--there are no obstacles, barriers, or obstructions within the space. One example is a water tank.
 - (b) Obstructed--the permit space contains some type of obstruction that a rescuer would need to maneuver around. An example would be a baffle or mixing blade. Large equipment, such as a ladder or scaffold, brought into a space for work purposes would be considered an obstruction if the positioning or size of the equipment would make rescue more difficult.

(2) Elevation

- (a) Elevated -a permit space where the entrance portal or opening is above grade by 4 feet or more. This type of space usually requires knowledge of high angle rescue procedures because of the difficulty in packaging and transporting a patient to the ground from the portal.
- (b) Non-elevated -a permit space with the entrance portal located less than 4 feet above grade. This type of space will allow the rescue team to transport an injured employee normally.

- (3) Portal size.
 - (a) Restricted--A portal of 24 inches or less in the least dimension. Portals of this size are too small to allow a rescuer to simply enter the space while using SCBA. The portal size is also too small to allow normal spinal immobilization of an injured employee.
 - (b) Unrestricted -- A portal of greater than 24 inches in the least dimension. These portals allow relatively free movement into and out of the permit space.

- **★**(4) Space access.
 - (a) Horizontal--The portal is located on the side of the permit space. Use of retrieval lines could be difficult.
 - (b) Vertical--The portal is located on the top of the permit space, so that rescuers must climb down, or the bottom of the permit space, so that rescuers must climb up to enter the space.
 Vertical portals may require knowledge of rope techniques, or special patient packaging to safely retrieve a downed entrant.

29 CFR 1910.146 Permit Required Confined Spaces

- Scope and Application
- Definitions
- General Requirements(to include development of written plan)
- Permit-Required Confined Spaces
- Permit System
- Entry Permit

- Training
- Duties of Authorized Entrants
 - **Duties of Attendants**
- Duties of Entry Supervisors
- Rescue and Emergency Services
- Employee Participation

Appendices

- **★** Appendix A Permit-required Confined Space Decision Flow Chart
- Appendix B Procedures for Atmospheric Testing.
- Appendix C Examples of Permit-required Confined Space Programs
- Appendix D Confined Space Pre-Entry Check List
- Appendix E Sewer System Entry
- Appendix F Rescue Team or Rescue Service Evaluation Criteria

"Acceptable entry conditions" means that conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permitrequired confined space entry can safely enter into and work within the space.

"Attendant" means an individual stationed outside one or more permit spaces who monitors the authorized entrants and performs all attendant's duties assigned in the employer's permit space program.

DUTIES OF ATTENDANTS

- Knows the hazards that may be faced during entry
- Is aware of possible behavioral effects of hazard exposure in authorized entrants;
- Continuously maintains an accurate count of authorized entrants
- Remains outside the permit space during entry operations until relieved by another attendant;

- Communicates with authorized entrants
- Monitors activities inside and outside the space
- Summons rescue and other emergency services Performs non-entry rescues as specified by the employer's rescue procedure
 - Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

"Authorized entrant" means an employee who is authorized by the employer to enter a permit space

Duties of Authorized Entrants

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Properly use equipment as required by paragraph (d)(4) of this section;
- Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph (i) (6) of this section;

Duties of Authorized Entrants (cont'd)

- Alert the attendant whenever:
- The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or
- The entrant detects a prohibited condition; and
- Exit from the permit space as quickly as possible whenever:
- An order to evacuate is given by the attendant or the entry supervisor,
- The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,
- The entrant detects a prohibited condition, or
- An evacuation alarm is activated.

"Emergency" means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

"Engulfment" means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

"Entry" means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of the opening into the space.

* "Entry permit (permit)" means a written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in section (f) of the standard.

* "Entry Supervisor" means the person (such as an employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

Note: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of the entry supervisor may be passed from one individual to another during the course of entry operations.

Duties of Entry Supervisor

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Terminates the entry and cancels the permit as required by paragraph (e)(5) of this section;

Duties of Entry Supervisor * Verifies that rescue services are available and that the

- Verifies that rescue services are available and that the means for summoning them are operable;
- Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
- Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

* "Hazardous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space, injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of10 percent of its lower flammable limit (LFL);

- "Hazardous atmosphere" (cont'd)
- (2) Airborne combustible dust at a concentration that meets or exceeds its LFL; NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.
- (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

- "Hazardous atmosphere" (cont'd)
- (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;
- NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- "Hazardous atmosphere" (cont'd)
- (5) Any other atmospheric condition that is immediately dangerous to life and health.
- NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communications Standard, section 1910.1200 of this Part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"Hot work permit" means the employer's written authorization to perform operations (For example: riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

"Immediately dangerous to life and health(IDLH)" means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

* "Inerting" means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

"Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

- ★ "Line breaking" means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.
- "Non-permit confined space" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

"Oxygen deficient atmosphere" means an atmosphere containing less than 19.5 percent oxygen by volume.

"Oxygen enriched atmosphere" means an atmosphere containing more than 23.5 percent oxygen by volume.

"Permit-required confined space program (permit space program)" means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

PRCS WRITTEN PLAN OUTLINE

- ★ Introduction Company Policy
- Definitions
- Identification of Confined Spaces
- Notification and Warning
- Hazard Identification
- Equipment for Entry & Rescue
- Evaluation of Confined Spaces
- Permits
- Authorized Entrants
- Authorized Attendants

PRCS WRITTEN PLAN OUTLINE (cont'd)

- Entry Supervisors
- Entry Procedures
- Communications Procedures
- Rescue Procedures
- Closure Procedures
- Coordination of Work With Contractors
- Program Review and Update (Annually Required)
- Training Requirements and Documentation

Definitions

"Permit system" means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

ENTRY PERMITS

- Permit Space to be Entered
- Purpose of Entry
- Date & Authorized Duration of Permit
- Authorized Entrants
- Authorized Attendants
- Name & Signature of Entry Supervisor
- Hazards of the Permit Space to be Entered
- Isolation of Hazard Control Measures
- Acceptable Entry Conditions
- Results of Initial & Periodic Atmospheric Monitoring
- Rescue & Emergency Services
- Communications Procedures
- Equipment Required for Entry & rescue Operations
- Other Necessary Information and Other Required Permits

Definitions

"Prohibited condition" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Definitions

"Rescue service" means the personnel designated to rescue employees from permit spaces.

NOTE: Rescue personnel may be industry emergency personnel, an outside rescue service or a combination of teams.

- (k) Rescue and emergency services.
- (1) An employer who designates rescue and emergency services, pursuant to paragraph (d)(9) of this section, shall:
- (i) Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified;

Note to paragraph (k)(l)(i): What will be considered timely will vary according to the specific hazards involved in each entry. For example, Sec. 1910.134, Respiratory Protection, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection while in work areas defined as IDLH atmospheres.

(ii) Evaluate a prospective rescue service's ability, in terms of proficiency with rescue-related tasks and equipment, to function appropriately while rescuing entrants from the particular permit space or types of permit spaces identified;

- (iii) Select a rescue team or service from those evaluated that:
- (A) Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified;
- (B) Is equipped for and proficient in performing the needed rescue services;

(iv) Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site; and (v) Provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

- The following requirements apply to employers who have employees enter permit spaces to perform rescue services.
- The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from permit spaces.
 - Each member of the rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants under paragraph (g) of this section.

Rescue & Emergency Services (cont'd)

- ★ Each member of the rescue service shall practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.
- Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). At least one member of the rescue service holding current certification in first aid and in CPR shall be available.

Definitions

* "Retrieval system" means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Definitions

- * "Testing" means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.
- NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

Testing Protocol

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

- Oxygen content,
- Flammable gases and vapors, and
 - Potential toxic air contaminants.

PRCS CONFINED SPACE SIGNAGE



CONFINED SPACE HAZARDS



CONFINED SPACE HAZARDS PRCS Fatalities

- 47% Air (Oxygen, Gases, Vapors)
- 21% Drowning (Engulfment)
- 19% Toxic (Liquids, Vapors, etc above PEL
- 10% Blunt Force Trauma
- 2% Electrocution (Mostly due to objects the victim took in with them)
- □ 1% Burns

Confined Space Hazards

- Hazardous Atmospheres
 - Asphyxiating atmospheres
 - Flammable atmospheres
 - Toxic atmospheres

Oxygen Deficient Atmosphere

- "Oxygen-deficient atmosphere" means an atmosphere containing less than 19.5 percent oxygen by volume
- Note: Exposures to atmospheres containing 12% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves

Oxygen-Enriched Atmosphere

"Oxygen-enriched atmosphere" means an atmosphere containing more than 23.5 percent oxygen by volume



Nitrogen (N2)

- Colorless, odorless inert gas
- Slightly lighter than air
- Vapor density (0.97)
- May displace oxygen and cause asphyxiation

Methane (CH₄)

- Natural, marsh or swamp gas
- Colorless, odorless, flammable gas
- Lighter than air
- Vapor Density (0.6)
- Toxic?
- LEL = 5%; UEL = 15%

Carbon Monoxide (CO)

- Colorless, odorless gas
- Slightly lighter than air
- Vapor Density (0.97)
- Chemical asphyxiant
- Primary source: incomplete combustion of organic material
- Gasoline-fueled combustion engines

Carbon Monoxide (CO) (cont'd)

- \star PEL = 50 ppm
- \square TLV/TWA = 25 ppm
- \square TLV/REL = 35 ppm
- TLV/STEL = 200 ppm
- IDLH = 1,500 ppm
- BEI: 3.5% COHb; 20 ppm (end-exhaled air)
- LEL = 12.5%; UEL = 74.2%

Hydrogen Sulfide (H2S)

- Sewer gas, stink gas (rotten eggs)
- Produce olfactory fatigue (loss of sense of smell)
- Odor threshold: 0.02-0.2 ppm
- Colorless, flammable gas
- LEL = 4.3% UEL = 46.0%
- Heavier than air
- Vapor density (1.18)

Hydrogen Sulfide (H₂S) (cont'd)

- PEL = 20 ppm 50 ppm-Peak (10 min once)
- $\frac{1}{10}$ TLV/TWA = $\frac{10}{10}$ ppm
- \square TLV/STEL = 15 ppm
- REL = 10 ppm (10 min)
- □ IDLH = 300 ppm

How Hazards Occur

- 1. Previously stored products/chemicals
- 2. Manufacturing processes
- 3. Operations/work being performed
- 4. Adjacent areas

Atmospheric Hazards Definitions

Vapor Density

The weight of a flammable vapor compared to air (Air=1). Vapors with a high density are more dangerous and require better ventilation because they tend to flow along the floor and collect in low spots.

Atmospheric Hazards Definitions

PEL

The Permissible Exposure Limit of a gas or vapor according to OSHA standards, expressed in parts of vapor per million parts of contaminated air. Many flammable and combustible liquids present an inhalation as well as a fire hazard.

Confined Space Hazards

- GENERAL HAZARDS
- Electrical
- Mechanical
- Engulfment
- Entrapment

Nature of Electrical Injuries

- The voltage of the circuit
- The resistance of the person's body
- The flow of current through the body
- The circuit path through the body

Engulfment Hazards

" Engulfment" means the surrounding and effective capture of a person by a liquid or finely-divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Mechanical/Entrapment Hazards

- Agitators
- Augers
- Unguarded chains
 - Unguarded pulleys
 - Unguarded rotating blades

- Unguarded belts
- Unguarded fans
- Moving parts
 - Rotating parts

Confined Space Hazards

- * PHYSICAL HAZARDS
- Thermal effects
- Noise
- Vibration
- Structural
- Corrosives

Thermal Effects

- Heat stress
- Cold stress

Noise Hazards

- Distraction
- Physical damage to ear
- Interference with communications
- Stress

Other Hazards

- Unstable or dangerous work surfaces
- Falling objects
- Insects or animals
- Biological

ATMOSPHERIC MONITORING



- Atmospheric testing is required for two distinct purposes:
- Evaluation of the hazards of the permit space
- and Verification that acceptable entry conditions for entry into that space exist.

★ There are nine basic rules for atmospheric testing. Following these rules will help you achieve reliable results so that you can operate safely in confined spaces.

The <u>first rule</u> to remember when monitoring a confined space is to monitor in the proper order. This means that at the very least you'll monitor for corrosivity before you take simultaneous readings for other hazards. If your equipment can't take simultaneous readings, then monitor in the following order: First, monitor for corrosivity, to protect your monitor from atmospheres that are too corrosive. Second, monitor for oxygen level, in order to be sure that you get an accurate flammability reading. Third, monitor for flammability, assuming that the presence of toxic gases has not already caused you any distress, and the threat of combustion is immediate. Finally, monitor for toxicity.

- The <u>second rule</u> relates to vapor density
- Gases that are heavier than air—those with a vapor density greater than one—will tend to lie low.
- Gases that are lighter than air—those with a vapor density less than one—will tend to rise and accumulate in traps along the top of the space.
- Gases that weigh about the same as air—those with a vapor density of close to one—tend to disperse within the atmosphere.

Vapor Density Examples:

 CH_4 Vapor Density = 0.6

CO Vapor Density = 0.97

H₂S Vapor Density = 1.19

★ GASES WITH A VAPOR DENSITY LESS THAN AIR

H - Hydrogen (0.07)

A - Anhydrous Ammonia (0.59)

H - Helium (0.14)

A - Acetylene (0.9)

M - Methane (0.6)

I - Illuminating Gas (Natural Gas & Neon) (0.7)

C - Carbon Monoxide (0.97)

E - Ethylene (0.97)

N - Nitrogen (0.97)

The third rule of atmospheric monitoring is to know your monitor's limitations. Limitations you should be familiar with include the monitor's sensitivity; the conditions it can detect, or selectivity; the percent volume in air required to give accurate flammability readings; the effect that temperature extremes, humidity, elevation, and barometric pressure can have on readings; and the gases and conditions that interfere with accurate detection and response.

The **fourth rule** of atmospheric monitoring is to know your monitor's operational parameters. Operational parameters can include the length of time the sensors are reliable, the number of pumps that are necessary when using a monitor that has a hand aspirator, and what accessories are required for proper operation within the environment.

The **fifth rule** of atmospheric monitoring is to realize that many flammable gases are also toxic.

The presence of toxic hazards in the air may be entirely independent of oxygen concentrations and flammable contaminants. Many atmospheric hazards, even when reduced below flammable levels, may still be toxic. Others when reduced below toxic levels, may still be flammable.

- ★ Some substances combined with air pose entirely different hazards at different concentrations. For example, methane gas is harmless below a concentration in air of 10 percent, explosive between 10 percent and 90 percent and asphyxiating above 90 percent.
- For instance, if a flammable substance is toxic at levels above 2000 parts per million, then all you need to determine if the atmosphere is toxic is the Lower Explosive Limit of the gas.

Rule six is to remember that some vapors migrate toward the exterior of the space, as if they were seeking openings to the outside. In other words, these vapors are coming to get you! Exercise great caution around substances like these, because they don't require you to go to them; instead, they'll come to you.

This is why you need to approach an unknown space with great caution, using pH paper and monitors to determine whether the space is giving off toxic or flammable gases with high vapor pressure.

* Rule seven is to zero and inspect and field calibrate the monitor in an area with clean air. Before using any monitoring equipment, check the equipment to make sure that it is zeroed for flammability and toxicity levels, and that it is reading 20.9 percent for oxygen level.

Follow the manufacturer's recommendations for the use of bump gas in the field.

★ Rule eight is to sample from a small opening in the space before opening it up, and to position yourself upwind from the space while monitoring. In most cases when you are called to a confined space incident, it will already be open. But if this isn't the case, remember that gases can accumulate around hatches, so it's best to open the hatch a crack and monitor before opening completely.

Standing upwind of a space also helps to ensure you aren't overcome by toxic gases while monitoring. It's also prudent to wear proper respiratory protection in certain cases.

★ The <u>ninth rule</u> for atmospheric monitoring is to make sure all batteries are charged sufficiently after each use. It's a good idea for somebody at your organization to conduct a battery check during each shift.

CONTROL OF HAZARDS



CONTROL OF HAZARDS

Ventilation

Isolation

Inerting or Flushing

VENTILATION

★ Ventilation normalizes the atmosphere by supplying clean air into the space or by exhausting contaminants, such as toxic or flammable gases, out of the space.

VENTILATION

- There are four main ventilation techniques that can be used to ventilate confined spaces:
- Supply, or positive pressure ventilation;
- Exhaust ventilation;
- Local negative pressure ventilation; and
- Positive-negative pressure ventilation.

ISOLATION

Lockout/Tagout

Blinding/Blanking

Double Block and Bleed

OTHER CONTROL TECHNIQUES

- Inerting
- (Note: Inerting with a gas such as nitrogen or carbon dioxide will result in an oxygen deficient atmosphere)
- Flushing

PERSONAL PROTECTIVE EQUIPMENT



RESPIRATORY EQUIPMENT

Self ContainedBreathingApparatus

Supplied Air Respirators

PROTECTIVE CLOTHING

- Coveralls
- Hard Hat
- Eye & Face Protection
- Hearing Protection
- Foot Protection
- Hand Protection

PROTECTIVE CLOTHING

Type III Harness

Fall Protection

Lifelines

COMMUNICATIONS

- Face to Face
 - Verbal
 - Hand Signals
- Radios
- Hardwired Systems
 - Rope System
 - OATH Method

CONFINED SPACE ACCIDENT REVIEW



Accident Report Fatal Fact No. 23

Fall from Tower

Type of Operation:

Painting

Contractor Crew

Painter, Age 24

Experience at this Type of Work 3 years

Time on Project 3 months

Employees were sand blasting and painting a water tower. A worker was spray painting the inside of the riser of the tower. He was standing on a fixed ladder 40 feet above the riser floor without wearing any fall protection gear. Apparently he slipped and fell through an opening in the floor of the riser onto a standpipe.

Accident Report Fatal Fact No. 25

- Accident Type: Fire/explosion
- Type of Operation:Installing water line
- Crew Size 3
- Employee Job Title Welder Age28
 - Experience 2 years
 - Time on Project 2 months
- A welder entered a steel pipe (24 inch) diameter) to grind a bad weld at a valve about 30 feet from the entry point. Before he entered, other crew members decided to add oxygen to the pipe near the bad weld. He had been grinding intermittently for about five minutes when a fire broke out enveloping his clothing. Another crew member pulled him 30 feet to the pipe entrance and extinguished the fire. However, the welder died the next day from his burns.

Accident Report Fatal Fact No. 39

- Accident Type: Asphyxiation
- Type of Operation: Boring, Jacking
- Crew Size: 6
- Employee Job Title:Laborer Age 23 Male
 - Experience at this Type of Work 1 day
 - Time on Project 1 hour
- ★ An employee sitting in a looped chain was lowered approximately 17 feet into a 21-foot deep manhole. Twenty seconds later he started gasping for air and fell from the chain seat face down into the accumulated water at the bottom of the manhole. An autopsy determined oxygen deficiency as the cause of death.

Review

- What is a Confined Space?
- What is a Permit Required Confined Space
- What is the OSHA Standard dealing with Permit Required Confined Spaces?
- When must an employer establish a confined space written program?
- What is the leading cause of confined space fatalities?
- What other training does rescuers require?